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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/590,044	06/08/2000	Joseph M. Jacobson	109026-0068	1282

7590 10/22/2002

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EXAMINER

BEREZNY, NEAL

ART UNIT PAPER NUMBER

2823

DATE MAILED: 10/22/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/590,044

Applicant(s)

JACOBSON ET AL.

Examiner

Neal Berezny

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 13 September 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 14-25, 29 and 30 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 26-28 is/are rejected.
- 7) ☒ Claim(s) 10 and 11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 June 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 11.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Claim Objections*

1. Claims 10 and 11 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim.

Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 9 forms the second layer on the first layer, however in claims 10 and 11, the second layer is deposited on the third layer, which was deposited on the first layer.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-13, and 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heller et al. (5,605,662) in combination with Yu et al. (6,303,943), Alivisatos, MRS Bulletin, Feb. 1998, and Bott et al. (3,865,550). Heller builds an array of bioelectronic device, causing the biomaterial, such as DNA and protein, to in electrical communication so as to have the biomaterial attached to the surface affect an electrical measurement, employing a self-assembly method, see abstract and fig.6. Heller does not appear to teach the use of nanoparticles with biomaterial shells, or the use of semiconductors, conductors, and insulators for making a transistor, nor the use

of multiple batches of particles for different layers, nor the step on sintering the particles. Yu teaches the use of nanoparticles with organic shells, col.19, ln.65 – col.20, ln.8, the use of semiconductors, conductors, and insulators for making a transistor, see fig. 1. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine Yu with Heller to modify the chemical detector surface of Heller, consisting of a biomaterial on a flat surface, with nanoparticles having organically active shells, such as shells with biomaterial, thereby greatly increasing the surface area of the organically active material and thereby increasing the efficiency of the chemical detector.

4. Alivisatos teaches and anticipates the use of organically active shells on nanoparticles, having electrical contact with and interacting with the environment, p.18, col.3, to produce electrical changes in the gate region of an FET, p.21, col.1. Alivisatos also teaches employing chains of nanoparticles, p.20, col.2, thereby suggesting multiple depositions of nanoparticles. Alivisatos also identifies that most of these devices have very high impedances, p.21, col.1, and provides the motivation to reduce impedance, p.21, col.2. Bott teaches the step of sintering the particles, col.2, ln.35-39. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine Alivisatos with Heller and Yu to form an array of ChemFETs with chains of nanoparticles, so as to increase the surface area of the active material, thereby increasing the efficiency of the device. It would be obvious to one of ordinary skill in the art at the time of the invention to combine Bott with Heller, Yu, and Alivisatos to sinter the nanoparticles, thereby improving the conductivity of the nanoparticle connections, thereby reducing the impedance of the device.

### ***Response to Arguments***

5. Applicant's arguments with respect to claims 1-13, and 26-28 have been considered but are moot in view of the new ground(s) of rejection. Although, the examiner will address some of applicant's arguments deemed relevant. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Applicant argues that Yu does not form shells. Applicant's attention is directed to col.19, ln.60-62, where Yu teaches forming a phase separated blend with nanoparticles, ie. forming layers around the particles. Furthermore, surfactant are well known to be used in coating nanoparticles to assist in the processing and handling of the nanoparticles. Applicant is reminded that examiner is required to interpret the claims as broadly as reasonably possible. A nanoparticle in a blend can be viewed as a nanoparticle with a shell of material surrounding it.

### **CONCLUSION**

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

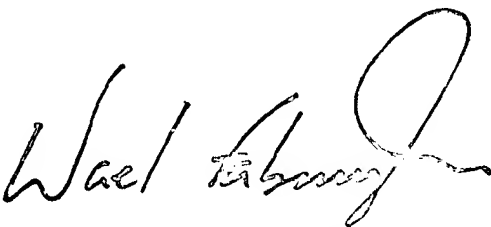
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TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Neal Berezny whose telephone number is (703) 305-1481. The examiner can normally be reached on Monday to Friday from 9:00 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy, can be reached at (703) 308-4918. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

  
SUPERVISORY PRIMARY EXAMINER  
TECHNOLOGY CENTER 2823

 10/19/02

Neal Berezny

Patent Examiner

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